

Application No.: 10/759,186
Amendment under 37 CFR 1.111
Reply to Office Action dated April 18, 2005
July 18, 2005

REMARKS

By this amendment, claims 2-5 and 16-19 have been cancelled, claims 1, 14 and 15 have been amended in the application and new claims 20-27 have been added in the application. Currently, claims 1, 6-15 and 20-27 are pending in the application.

Claims 1-19 were rejected under 35 USC 102(b) as being anticipated by Sakaguchi et al. (U.S. Patent No. 5,003,169). Claims 1-4, 14-17 and 19 were rejected under 35 USC 103(a) as being obvious over De Missimy et al. (U.S. Patent No. 3,805,061) in view of Sakaguchi et al.

These rejections are respectfully traversed in view of the amendments to the claims and the remarks below.

The present invention relates to a multi-optical axis photoelectric sensor configured by light projecting and receiving units each of which is formed by disposing a plurality of optical elements in a line.

Specifically, Fig. 18 relates to the light projecting unit 20 and shows an example where the additional element holder 210 is coupled to the main element holder 202 thereby to constitute

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the sixteen optical axes. The main element holder 202 is provided at the one end portion thereof with the receiving hole 214. When the additional element holder 210 is moved in a direction substantially perpendicular to the arrangement direction of the optical axis relative to the main element holder 202, the engagement projection 212 of the additional element holder 210 is inserted into the receiving hole 214 of the main element holder 202. Thus, when the engagement projection 212 is fit into the receiving hole 214, the hook 213 of the additional element holder 210 engages with the end edge of the main element holder 202, whereby the mechanical coupling of the additional element holder 210 with respect to the main element holder 202 is completed. The light receiving unit 30 can be arranged in the same manner.

By this amendment, independent claim 1 has been amended to recite "wherein said second engagement portion of said additional element holder and said first engagement portion of said main element holder are engaged by relative movement of at least one of said main element holder and said additional element holder perpendicular to a longitudinal axis of at least one of said main element holder and said additional element holder; and wherein

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said first engagement portion of said main element holder is located between at least two of said plurality of light guide housings disposed along the longitudinal axis of said main element holder".

Similarly, independent claim 14 has been amended to recite "wherein said second engagement portion of said additional element holder and said first engagement portion of said main element holder are engaged by relative movement of at least one of said main element holder and said additional element holder perpendicular to a longitudinal axis of at least one of said main element holder and said additional element holder; and wherein said first engagement portion of said main element holder is located between at least two of said plurality of light guide housings disposed along the longitudinal axis of said main element holder".

Similarly, independent claim 15 has been amended to recite "wherein said second engagement portion of said first additional element holder and said first engagement portion of said first main element holder are engaged by relative movement of at least one of said first main element holder and said first additional element holder perpendicular to a longitudinal axis of at least

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one of said first main element holder and said first additional element holder; wherein said first engagement portion of said first main element holder is located between at least two said plurality of light guide housings disposed along the longitudinal axis of said first main element holder". Also, independent claim 15 has been amended to recite "wherein said fourth engagement portion of said second additional element holder and said third engagement portion of said second main element holder are engaged by relative movement of at least one of said second main element holder and said second additional element holder perpendicular to a longitudinal axis of at least one of said second main element holder and said second additional element holder; and wherein said third engagement portion of said second main element holder is located between at least two of said plurality of light guide houses disposed along the longitudinal axis of said second main element holder".

These features are not shown or suggested by Sakaguchi et al., De Missimy et al. or any combination of these references.

Sakaguchi et al. relate to a photoelectric switch in which a light-emitting section composed of a plurality of light-emitting elements is confronted with a light-detecting section composed of

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a plurality of light-detecting elements, thus forming a multi-optical-path.

Sakaguchi et al. disclose that in Fig. 1, the light-detecting section 10 includes a base unit 11, at least one relay unit 12 which can be connected to the top of the base unit 11, and an end unit 13 which can be connected to the top of the base unit 11 or the relay unit 12.

Sakaguchi et al. also disclose that in Fig. 28, a relay unit 96 has an angle adjusting means, namely, a movable connecting member 95 disposed between a connecting part 93 and a connected part 94 so that the angle between the connecting part 93 and the connected part 94 can be changed.

Sakaguchi et al. also disclose that Fig. 33 shows a structure of the connecting parts of the units. Substantially T-shaped protrusions 125 and 126 are formed on the end face of a first unit, and a male connector 128 with male terminals 127 is secured to the top of the protrusion 125. Engaging grooves 129 are formed in the front and rear surfaces of the first unit 125. On the other hand, a second unit has a groove 131 in its end portion which is substantially similar in configuration to the protrusions 125 and 126 of the first unit. A female connector

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133 having female terminals 132 as shown in Fig. 34 is provided at the bottom of the groove 131. An engaging groove 134 is formed in the front surface of the second unit 130 in such a manner that it converges inwardly.

Applicant respectfully submits that Fig. 28 of Sakaguchi et al. is different from the present invention because the present invention discloses that a plurality of light guide housings of each of the holders are provided in a line along the longitudinal axis of each of the holder. Also, applicant respectfully submits that Figs. 33 and 34 of Sakaguchi et al. are different from the present invention because Sakaguchi et al. need a T-shaped projection portion to engage with another unit and Sakaguchi et al. do not show that the engagement portion of the main element holder is located between the plurality of light guide housings.

Also, Sakaguchi et al. do not disclose that the second engagement portion of the additional element holder and the first engagement portion of the main element holder are engaged by relative movement of at least one of the main element holder and the additional element holder perpendicular to a longitudinal axis of at least one of the main element holder and the additional element holder; and wherein the first engagement

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portion of the main element holder is located between at least two of the plurality of light guide housings disposed along the longitudinal axis of the main element holder, as claimed in claims 1, 14 and 15.

Sakaguchi et al. also do not disclose that the fourth engagement portion of the second additional element holder and the third engagement portion of the second main element holder are engaged by relative movement of at least one of the second main element holder and the second additional element holder perpendicular to a longitudinal axis of at least one of the second main element holder and the second additional element holder; and wherein the third engagement portion of the second main element holder is located between at least two of the plurality of light guide houses disposed along the longitudinal axis of the second main element holder as claimed in claim 15.

For these reasons, it is believed that Sakaguchi et al. do not show or suggest the present claimed features of the present invention. Applicant also submits that De Missimy et al. do not make up for the deficiencies in Sakaguchi et al.

De Missimy et al. relate to an apparatus for sensing the presence of objects in a predetermined area and more particularly

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to photosensitive detection apparatus. De Missimy et al. disclose that in Fig. 1, the transmitter housing 2 contains three similar assemblies 6A, 6B and 6C, each comprising a plurality of uniformly spaced light sources 8.

De Missimy et al. also disclose that similarly, the receiver housing 4 contains three similar assemblies 16A, 16B and 16C, each comprising a plurality of photodetectors 18.

De Missimy et al. do not disclose that the second engagement portion of the additional element holder and the first engagement portion of the main element holder are engaged by relative movement of at least one of the main element holder and the additional element holder perpendicular to a longitudinal axis of at least one of the main element holder and the additional element holder; and wherein the first engagement portion of the main element holder is located between at least two of the plurality of light guide housings disposed along the longitudinal axis of the main element holder as claimed in claims 1, 14 and 15.

De Missimy et al. also do not disclose that the fourth engagement portion of the second additional element holder and the third engagement portion of the second main element holder

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are engaged by relative movement of at least one of the second main element holder and the second additional element holder perpendicular to a longitudinal axis of at least one of the second main element holder and the second additional element holder; and wherein the third engagement portion of the second main element holder is located between at least two of the plurality of light guide houses disposed along the longitudinal axis of the second main element holder as claimed in claim 15.

Sakaguchi et al. do not make up for these deficiencies as Sakaguchi et al. do not have such a connection as discussed above.

It is therefore respectfully submitted that De Missimy et al. and Sakaguchi et al., individually or in combination, do not teach, disclose or suggest the presently claimed invention and it would not have been obvious to one of ordinary skill in the art to combine these references to render the present claims obvious.

New dependent claims 20 and 21, which directly depend from independent claim 1, have been added in the application. Also, new dependent claims 22 and 23, which directly depend from independent claim 14, have been added in the application. Also, new dependent claims 20 and 22 recite "said second engagement

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portion having a cantilever portion, which is projected from one end of said additional element holder, is disposed in said first engagement portion of said main element holder". New dependent claims 21 and 23 recite "said second engagement portion of said additional element holder is located between at least two of said plurality of light guide housings disposed along the longitudinal axis of said additional element holder". Applicant respectfully submits that these claims recite additional features and also define over the prior art of record. Sakaguchi et al. and De Missimy et al. do not teach or disclose that the second engagement portion having a cantilever portion, which is projected from one end of the additional element holder, is disposed in the first engagement portion of the main element holder and the second engagement portion of the additional element holder is located between at least two of the plurality of light guide housings disposed along the longitudinal axis of the additional element holder. Allowance of these claims is also respectfully requested.

Similarly, new dependent claims 24-27, which depend from independent claim 15, have been added in the application. New dependent claim 24 recites "said second engagement portion having

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a cantilever portion, which is projected from one end of said first additional element holder, is disposed in said first engagement portion of said first main element holder". New dependent claim 25 recites "said second engagement portion of said first additional element holder is located between at least two of said plurality of light guide housings disposed along the longitudinal axis of said first additional element holder". New dependent claim 26 recites "said fourth engagement portion having a cantilever portion, which is projected from one end of said second additional element holder, is disposed in said third engagement portion of said second main element holder". New dependent claim 27 recites "said fourth engagement portion of said second additional element holder is located between at least two of said plurality of light guide housings disposed along the longitudinal axis of said second additional element holder".

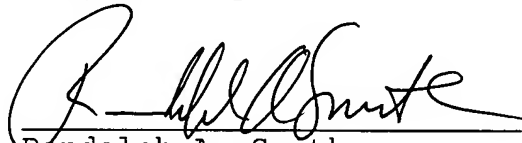
Applicant respectfully submits that these claims recite additional features and also define over the prior art of record as described above. Allowance of these claims is also respectfully requested.

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In view of foregoing claim amendments and remarks, it is respectfully submitted that the application is now in condition for allowance and an action to this effect is respectfully requested.

If there are any questions or concerns regarding the amendments or these remarks, the Examiner is requested to telephone the undersigned at the telephone number listed below.

Respectfully submitted,



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